Energy-SmartOps Integrated Control and Operation of Process, Rotating Machinery and Electrical Equipment

Collaborative production optimization of a steel plant

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About me

- Education

2010-2013: MSc Eng Control Systems Engineering Supélec (Graduate Engineering School)

2013: MSc. Control and signal processing University Paris-South 11

- Experience

@CEA. Programming by demonstration of an industrial robotic arm

@CODRA. GUI industrial software development

Background and skills

- Control Systems design
  - Model-based approach
  - Control theory
  - Matlab/Simulink proficiency

- Object-Oriented programming
  - Software development process
  - Good knowledge of Java and C#
  - Graphical User Interfaces

Me in the ITN

- Employee of 🖐️ Corporate Research Germany as **ESR-N**

- Secondment at AST in Italy

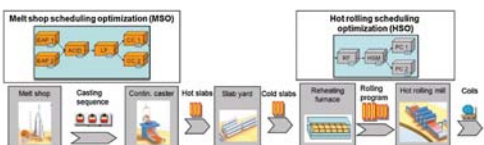- Cooperation with Drago [**ESR-L**] mainly , Hubert and Matteo B. [**ESR-K&I**]

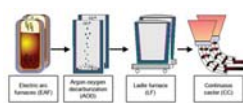## Context of the project

- Stainless steel industry
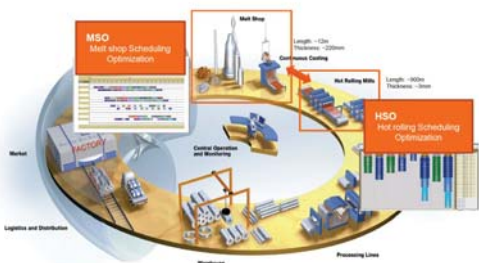
- Scope of the optimization :

Two independent schedulers

- Meltshop Scheduling optimization

  - Short term (2-3 days)
  - Optimal grouping and sequencing of heats
  - Ensure continuous casting

- Hot rolling Scheduling Optimization

  - Short and midterm (1 month)
  - Optimal grouping and sequencing of slabs

Previous work

- Potential for energy savings:

Long storage time in slab yard = heat loss

- Solution developed (Xu 2012) : **CPO** Coordination between MSO and HSO

- The **intersection coordination heuristic** organizes the dialog between the two schedulers runned in parallel

My tasks and objectives

- Push further the Collaborative Production Optimization:
  - Improve the existing heuristic
  - Implement the solution

- Pilot testing of the solution in a real production environment:
  - Develop a software demonstrator with an intuitive GUI
  - Prove that energy savings can be realized

- Link between ABB research and the industrial partner:
  - Understand the customer´s current operating practice and requirements
  - Customize the software

References

- I. Harjunkoski and I. E. Grossmann, 2001, A Decomposition Approach for the Scheduling of a Steel Plant Production, Computers & Chemical Engineering, 25, pp. 1647-1660
- C. Xu, G. Sand, I. Harjunkoski and S. Engell, 2012, A new heuristic for plant-wide schedule coordination problem: The intersection coordination heuristic, Computers & Chemical Engineering, 42, pp.152-167

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